

WILDLIFE EFFECTS ANALYSIS

BIRD TRACK SPRINGS FISH HABITAT ENHANCEMENT PROJECT

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INTRODUCTION

This analysis describes the terrestrial wildlife species found in the project area and the effects of the alternatives on these species. Rather than addressing all wildlife species, discussions focus on Forest Plan management indicator species (MIS); threatened, endangered and sensitive (TES) species; Forest Plan featured species; and landbirds. The existing condition is described for each species, group of species, or habitat. Direct, indirect and cumulative effects of alternatives are identified and discussed. Supporting wildlife documentation is located in the Project Record, and includes detailed data, methodologies, analysis, conclusions, maps, references and technical documentation used to reach conclusions in this environmental analysis.

PROJECT AREA

The analysis area is approximately 10 air miles west of La Grande, Oregon along approximately 1.9 miles of the Grande Ronde River along State Highway 244. The area consists of 1.2 miles of river on National Forest system lands, 0.1 miles along state lands, and 0.6 miles on privately owned lands along the reach beginning from just upstream of Bird Track Springs Campground downstream to Bear Creek Ranch. The project area is entirely within the Coleman Ridge-Grande Ronde River sub-watershed within the Grande Ronde River-Beaver Creek watershed. The general legal description is Township 3 south, Range 36 east, sections 15 and 16.

ALTERNATIVES

Alternative 1 (No Action): This alternative maintains current conditions and serves as a reference point for comparing alternatives.

Alternative 2 (Proposed Action): Alternative 2 was designed to address the purpose and need of re-establishing hydraulic conditions creating a mosaic of diverse habitat types, improving channel-floodplain interactions to increase connectivity to dissipate high-water flows and resolve water ice issues; and improve riparian vegetation condition and vitality, streambank stability, and nutrient cycling within this reach of the Grande Ronde River. The majority of the wood needed to be placed in-stream to accomplish some of these goals will be harvested off of private land directly adjacent to the restoration area.

MANAGEMENT INDICATOR SPECIES (MIS)

The Wallowa-Whitman National Forest Land and Resource Management Plan (LRMP) identifies five wildlife species, or groups of species, as MIS, or Management Indicator Species (U.S. Forest Service, 1990). These species are identified because of their special habitat needs that may be influenced significantly by planned management activities, and as a result their populations can be used to indicate the health of a specific type of habitat. MIS species welfare can be used as an indicator of other species dependent upon similar habitat conditions.

Table 1 - Wallowa-Whitman National Forest Management Indicator Species

Management Indicator Species	Habitat	Presence Within Analysis Area
Rocky mountain elk	Cover and forage	Yes
American marten	Old growth and mature forest	No
Northern goshawk	Old growth and mature forest	Yes
Pileated woodpecker	Old growth and mature forest	Yes
Primary cavity excavators*	Snags and logs	Yes

* Northern flicker; black-backed, downy, hairy, Lewis', three-toed, and white-headed woodpeckers; red-naped and Williamson's sapsuckers; black-capped, and mountain chickadees; and pygmy, red-breasted, and white-breasted nuthatches

Rocky Mountain Elk

Rocky Mountain elk have been selected as an indicator of habitat diversity, interspersed cover and forage area, and security habitat provided by areas of low human disturbance. Elk management on the Wallowa-Whitman National Forest is a cooperative effort between the Forest Service and the Oregon Department of Fish and Wildlife (ODFW). The Forest Service manages habitat while ODFW manages populations by setting seasons, harvest limits, and goals for individual Wildlife Management Units (WMU). The East Face project lies within the Starkey WMU.

Potential elk habitat effectiveness may be evaluated using the Habitat Effectiveness Index (HEI; Thomas et al. 1988). This model considers the density of open roads, the availability of cover habitat, the distribution and juxtaposition of cover and forage across the landscape, and forage quantity and quality. More recently, Rowland et al. (2005) has proposed the use of distance band analysis (DBA) to better understand the effects of roads on elk security habitat.

Background Information

Rocky Mountain elk (*Cervus canadensis nelsoni*- hereafter elk) are an important big game species in northeastern Oregon (Csuti et al. 2001) and are an indicator of the quality and diversity of forested habitat (defined as $\geq 40\%$ canopy closure, USDA LRMP 1990) which includes an interspersed cover and forage areas, and security habitat provided by cover and low levels of human activity (Thomas 1979). It is commonly accepted that the other big game species (i.e. mule deer, white-tailed deer, black bear, and cougar) are at least partially accommodated when high quality elk habitat is present. Elk are habitat generalists; they exploit a variety of habitat types in all successional stages and their patterns of use change daily and seasonally (Toweill and Thomas 2002). Elk are quite responsive to land management activities, thus the density or health of elk populations (as opposed to examining population trends) most likely indicate the effectiveness of elk management. (Toweill and Thomas 2002).

Logging generally results in increased elk forage, with declines in the short term (1-3 years), followed by large increases in forage that may last 10 years or longer (Wisdom et al. 2005). Large-scale habitat manipulations are being conducted with increased frequency in western forests, and although fuels reduction via thinning or prescribed burning often is assumed to benefit wildlife (Toweill and Thomas 2002, Wisdom et al. 2005), based on the interacting effects of fuels reduction and season on forage characteristics, Long et al. (2008) suggests that maintaining a "mosaic of burned and unburned forest

habitat may provide better long-term foraging opportunities for elk than burning a large proportion of the stand on a landscape.”

Displacement of elk from areas during human activities (e.g. logging, fuels reduction) is well documented (Edge 1982, Toweill and Thomas 2002, Wisdom et al. 2005a). Under most cases, this displacement is temporary, and there is no evidence that elk will not eventually return to harvested areas (Toweill and Thomas 2002). Of much more concern to resource managers are the establishment of roads associated with harvest activities that increase accessibility to recreationists (e.g. hunter, hikers, cross country skiers, OHV). Increased road use by recreationists has been shown to significantly reduce elk security (Towill and Thomas 2002), increase stress levels (Creel et al. 2002), and increase elk vulnerability to mortality from both legal and illegal hunter harvest (Rowland et al. 2005).

Blue Mountain/WWNF Population Viability

The National Forest Management Act (1976) requires that habitat exist to provide for viable populations of all native and desires non-native vertebrates. Elk is a game species that is managed on a management objective (M.O.) basis. Management objectives were developed to consider not only the carrying capacity of the lands, but also the elk population size that would provide for all huntable surplus, and tolerance levels of ranchers, farmers, and other interests that may sometimes compete with elk for forage and space. Biologically, a population that is managed around a M.O. is much larger than a minimum viable population. A minimal viable population represents the smallest population size that can persist over the long term. Historically there were game species, including elk, which warranted serious conservation concerns due to depressed populations and range contractions resulting from unregulated market and sport hunting and loss of habitat. Many of the factors that contributed to the decline of large wild ungulates in the past do not exist today. Currently, elk populations on the WWNF are regulated by hunting and predation. Elk numbers are substantially higher than what would constitute a concern over species viability.

Existing Condition

The Bird Track Springs project area falls within the Starkey WMU (ODFW). Population estimates in the Starkey unit from 1990-2000 averages 4,750 animals with cow/calf ratios estimated at 21/100 and bull/cow ratios estimated at 9/100 (Schommer and Johnson 2003). The Starkey Unit is within the Umatilla-Whitman Province. Population estimates in the province are 116% of the management objective of 17,100.

The Jordan Creek Ranch lies to the north of the project area. 1,059 acres are proposed for commercial and non-commercial treatments which will provide large wood structure for in-stream placement. The majority of forested stands within the Jordan Creek Ranch are dry and contain ponderosa pine, grand fir, Douglas-fir and western larch. Many of the stands are in a structure stage of understory reinitiation and have an overstocked understory. According to the land manager approximately 2,000 elk occupy the land. There is minimal human and road disturbance as this area is closed to the public.

The forested area directly adjacent to the western area of the Bird Track Springs project area provides designated winter range habitat for big game. This area is closed to motorized vehicles from Dec 15 – April 30th every year.

The Grand Ronde River- Beaver Creek watershed was analyzed using a habitat effectiveness model (Thomas et al. 1988) to assess the quality of elk habitat. The HEI model evaluates size and spacing of

cover and forage areas, density of open roads, quantity and quality of forage available to elk and cover quality. Forage data is unavailable and is not included in the total HEI value.

Table 2. Habitat effectiveness index calculations for elk habitat within the Grande Ronde- Beaver Creek watershed.

Habitat Effectiveness Variable	Habitat Effectiveness Value (Optimal = 1.0)	Comments
HE cover	0.69	Amount of satisfactory cover relative to marginal cover- No numerical standard in the LRMP, but it states “to provide near-optimum cover and forage conditions for big game”
HE size and spacing	0.75	Mosaic of cover and forage – at least 80% of the treated area that converts cover to forage is to be within 600 ft of a satisfactory cover patch at least 40 acres in size
HE road density	0.54	Open road density ≤ 1.51 mi/ mi ²
Total HEI	0.66	LRMP MA-3 ≥ 0.74 HEI

¹ HEI calculations do not include a forage variable because current, reliable forage data are not available.

Cover quality- Forests stands with relatively closed canopies function as thermal and security cover, providing a visual barrier from predators, and may reduce the effects of ambient temperature, wind, and long and short wave radiation functions on energy expenditure (i.e. increased metabolic rates) in elk. The Wallowa-Whitman LRMP establishes a minimum standard for big game thermal cover (marginal and satisfactory combines). At least 30% of the forested lands should be maintained in a thermal cover condition. All Management Areas were pooled for analysis, because they have the same cover standard, thus providing for a more landscape-scale based approach. An HEI value of 0.69 (Table 2) indicates a higher than average level of satisfactory cover.

Size and Spacing – Thomas et al. (1979) suggest that size and spacing of cover and forage habitat is a key to elk use of forested habitat, and this assumption was verified by Leckenby (1984) in the Blue Mountains of northeastern Oregon. Size and spacing of habitat is considered optimal when cover to forage edge widths are between 100-200 yards (Thomas et al. 1988). Considering an HE value of 1 is optimal, an HE size and spacing value of 0.75 (Table 2) indicates that forage to cover ratios within the analysis area is higher than average but less than optimal. However, this variable is not meant to stand alone and therefore management decisions for providing optimum elk habitat solely based on HE size and spacing value should be used with caution.

Open Roads – Excessive open road densities have deleterious effects on habitat effectiveness by taking land out of production (1 road mile equals 4 acres of land), reducing the effectiveness of cover and increasing disturbance to elk. The existing average open road density within the Grande Ronde- Beaver creek analysis area is 1.51 mi/mi² (Table 2). The average open road density is lower than the forest plan guideline of 2.5mi/mi² for MA-1. However, the road density estimate does not take into account off-road vehicle use on OHV trails, cross-country travel and on closed roads. When these variables are taken into account, road density estimates are likely to be higher.

Direct/Indirect Effects

Alternative 1 – Under the no action alternative there would be no direct/indirect effects toward elk because there would no habitat alteration or associated disturbances.

Alternative 2- Under the proposed action, 1,059 acres of private land has the potential to be impacted with a commercial harvest to obtain racking material and large wood structure. Approximately 197 acres of small diameter trees will be cleared to enlarge an area for cattle grazing, 562 acres will be treated with an improvement harvest and approximately 300 acres would be treated with an overstory removal harvest.

Direct-Direct effects to elk from harvest activities would be the disturbance associated with increased human activity. Noise, visual disturbance, and increased human traffic are likely to displace elk from the area for the duration of the disturbance. The private land occurs in an area likely used by elk as winter range. Displacement during this time could affect over-winter survival by causing animals to mobilize stored bodily energy reserves that are needed to survive the winter when food is scarce. If harvest activities are conducted outside the winter season, it is likely to have a lesser disturbance effect on the elk.

Indirect- Project activities would remove 197 acres of currently small diameter trees and 300 acres of large overstory trees. This will reduce canopy cover and likely increase forage in the short term (10 years). Existing conditions within the watershed show a surplus of cover. Cover: forage ratios would remain the same across the majority of the watershed and the minimal increase in forage would not affect elk distribution. Project activities would not change the cover: forage or size and spacing HEI values

Cumulative effects- Effects of past activities including road construction, fire suppression, prescribed fire, and timber management on WWNF lands have been incorporated into the existing condition. The current condition of elk habitat is largely a function of past management activities and historic large wildfires. Historically, the area was unroaded, and forest stands were less dense and provided larger amounts of forage.

Cattle grazing will continue within the watershed as an existing condition. The majority of range acres in the project area are grazed from June 1 – October 30. Resource partitioning between elk and cattle in northeastern Oregon was studied by Stewart et al. (2002). Elk utilized steeper slopes and higher elevations than cattle when cattle were present, possibly indicating competitive displacement of elk by cattle. Diet overlap between cattle and elk has been described, and is most prominent when forage resources are limited. However, most of the rangeland on NFS lands contained within the analysis area is in satisfactory condition.

A small stand (<70 acres) within the watershed is planned for a thinning treatment in the foreseeable future. This stand lies within designated winter range for elk and would be treated outside of the restricted time period (Dec 15th- April 30th). This stand is already considered in forage condition and would not change the cover:forage ratio within the watershed.

Proposed project activities on private land and future thinning within the watershed will not affect cover: forage or size and spacing values within the Grande Ronde River- Beaver Creek watershed, due to the small scale of proposed activity. No long term sources of disturbance (i.e. new roads) are proposed for the landscape. Because of this, harvest activities within the private land would not contribute to cumulative effects for elk.

Old Growth Habitat: American Marten, Northern Goshawk, and Pileated Woodpecker

Introduction

The American marten, northern goshawk, and pileated woodpecker are MIS of old growth habitat (U.S. Forest Service 1990). Old growth is a structural classification used to implement direction in the Forest Plan Amendment #2 (Screens; U.S. Forest Service 1995) and refers to multi-strata stands with large trees (Old Forest Multi-Stratum- OFMS) and single-stratum stands with large trees (Old Forest Single Strata- OFSS). Although the two terms have different administrative implications, both are intended to provide habitat for old growth associated wildlife species.

The American marten (*Martes americana*, - hereafter marten) is associated with mature, mesic coniferous forests and is one of the most habitat-specialized mammals in North America (Bull and Heater 2001). Martens require complex physical structure in the forest understory created by lower branches of trees, shrubs and coarse woody debris (Buskirk and Ruggiero 1994, Witmer et al. 1998, Bull and Heater 2000). Marten in northeastern Oregon have been documented using large-diameter hollow trees and logs, accumulations of coarse woody debris, and trees with brooms for denning and resting sites (Bull and Heater 2000). 70% of martens in eastside mixed conifer forests used snags > 23.9 in dbh for denning and resting and downed wood > 20.7 in dbh for denning, resting and foraging (Mellen-McClean et al. 2009).

The Northern goshawk (*Accipiter gentilis*, hereafter goshawk) was chosen as a supporting indicator of abundance and distribution of mature and old-growth forests (LRMP 1990). The goshawk is associated with dense canopied mixed conifer, white fir, and lodgepole pine associations (Wisdom et al. 2000). Important habitat attributes of goshawk prey species include snags, down logs, woody debris, large trees, openings, herbaceous and shrubby understories, and an intermixture of various forest structural stages (Wisdom et al. 2000). Goshawks are prey generalists and use open understories below the forest canopy and along small forest opening to forage for mammals and small birds (Bull and Hohman 1994, Marshall 1992, Squires 2000).

The pileated woodpecker (*Dryocopus pileatus*) occurs primarily in dense mixed-conifer forest in late seral stages or in deciduous tree stands in valley bottoms. It is occasionally seen in younger stands lacking large diameter trees, particularly in winter. It is rarely found in stands of pure ponderosa pine. The association with late seral stages stems from the need for large diameter snags or living trees with decay for nest and roost sites, large diameter trees and logs for foraging on ants and other arthropods, and a dense canopy to provide cover from predators (Marshall et al. 2003).

Correct determination of the scale of analysis is the cornerstone of habitat analysis (Morrison et al. 2006). The choice of spatial scale must be based on the species' relationship with the landscape and should consider the scale at which to apply our results for management purposes (Morrison et al., 2006). Wildlife habitat is commonly analyzed at the watershed scale because it provides a systematic way to understand and organize ecosystem information and thus enhances the ability to estimate direct, indirect, and cumulative effects of management activities (Regional Interagency Executive Committee 1995). However, the watershed scale may be too fine to analyze viability for wide-ranging species' unless it can be placed within the broader context of how the watershed contributes to overall species viability (Regional Interagency Executive Committee 1995).

Impacts to old growth and old growth dependent MIS species within the Bird Track Springs project area were determined by analyzing effects to their habitat at several spatial scales starting with the watershed then framing that within the context of the Wallowa-Whitman National Forest and the Blue Mountains Ecological Province. These scales take into account the species' relationship with the landscape as well as being practical for management purposes. MIS population viability assessments have been conducted for American marten, pileated woodpecker, and northern goshawk at the Blue Mountains and WWNF. These assessments are incorporated by reference within the existing condition and effects analysis for each species. For more in-depth information on the methodology behind these assessments, please refer to the

full-length assessments in the project record and the associated peer-reviewed literature scales (Penninger and Keown 2011a, Penninger and Keown 2011b, Penninger and Keown 2011c).

I. Old Growth Structure

Background information

Regional Forester Amendment #2 of June 12, 1995 established interim riparian, ecosystem, and wildlife standards for timber sales (these standards are referred to as the “Eastside Screens”). The Eastside Screens require that a range of variation approach be used when comparing historical reference and current conditions, incorporating the best available science. The range of variation approach assumes that native species have evolved with the historical disturbance regimes of an area and so a forest will continue to sustain populations of those species if current conditions fall within the historic range of variation (Powell 2010). The following range of variation analysis uses methods described in Range of Variation Recommendations for Dry, Moist and Cold Forests (Powell 2010), which is now considered the best available science. Five forest structural stages are identified within these three potential vegetation groups; Stand Initiation (SI), Stem Exclusion (SE), Understory Retention (UR) and Old Forest Single Stratum (OFSS) and Old Forest Multi Strata (OFMS).

LRMP standards and guidelines

The Regional Forester’s Eastside Forest Plan Amendment #2 (SCREENS) contains standards and guidelines for old growth (U.S. Forest Service 1995). Standards and guidelines include maintaining all existing remnant late and old seral and/or structural live trees >21” dbh. According to the LRMP, areas allocated to MA15 have no scheduled timber harvest although salvage may occur following catastrophic destruction if more suitable replacement stands exist.

The SCREENS also provides direction for connectivity. Old growth stands are directed to be connected in a least two different directions by the shortest length, minimum 400 ft. wide corridor which maintains canopy cover in the upper one-third of the site potential. If this standard cannot be met, proposed treatments are dropped.

Existing Conditions

Late Old-Growth Structure

Analysis was conducted at the watershed level. Moist old forest multi-story (OFMS) is below HRV and all potential vegetation groups (PVG) are below the historic range of variability (HRV) and deficient in old forest single-story (OFSS) (Table 3).

Table 3 - Comparison of HRV to existing by potential vegetation group (PVG) in the Grande Ronde River-Beaver Creek watershed

PVG	Existing Acres	% of PVG	Historical Range %
Old Forest Multi Stratum (OFMS)			
moist upland	2,361	12.4%	15-20%
dry upland	1,611	7.7%	5-15%
cold upland	2,657	18.6	10-25%
Old Forest Single Stratum (OFSS)			
moist upland	44	0.2%	10-20%
dry upland	91	0.4%	40-60%
cold upland	0	0%	5-20%

Direct/Indirect Effects

Alternative 1- Under the no action alternative, there would be no direct or indirect impacts to old growth because there would no harvest.

Alternative 2- There will be no harvest associated with the project taking place on Forest Service land. Harvest is planned on 1,059 acres of private land to obtain racking material and large wood structure. This area is primarily within the dry PVG and the majority of tree species consist of ponderosa pine, western larch, grand fir and Douglas fir. This area has a history of heavy harvest including targeting snags and down woody material. Emphasis in the past has been placed on economic value over ecological. As a result the area is deficient in large trees over 21”dbh, snags, down woody structure and old growth structure stages. None of the proposed action will take place within old growth and no old growth was observed on the property. The majority of the proposed units are within an understory reinitiation stage or a stem exclusion structural stage and are not nearing old growth conditions.

Under the proposed action, approximately 197 acres of small diameter trees will be cleared to enlarge an area for cattle grazing, 562 acres will be treated with an improvement harvest and approximately 300 acres would be treated with an overstory removal harvest. Commercial and non-commercial treatments in the proposed action would not directly impact old growth conditions because no existing old growth would be affected. Indirectly these treatments would preclude affected stands from becoming old growth in the medium to long term (25-50 years). However, the current owner and land manager have expressed a desire to enhance the area for wildlife. Existing snags and down woody debris will be maintained and can help provide future habitat for old growth dependent species as the stands mature over time.

Cumulative effects- This project does not impact current old growth conditions and there will be no cumulative effects from the project.

II. American Marten (*Martes americana*)

Viability Determination

Wisdom et al. (2000) assessed broad-scale trends of 91 species in the interior Columbia Basin, including the marten. The historical estimate of source habitat for marten in the Blue Mountains was 8.83%, which increased to 23.5% by the 1990s. By managing habitat similar to historical conditions, it is assumed that remaining habitat will be adequate to ensure population viability because species survived those levels of habitat in the past to be present today (Landres et al. 1999).

Source habitat for marten was evaluated on the Wallowa-Whitman National Forest (Penninger and Keown 2011a) and represents the highest quality habitat which contributes to species viability. Source habitat for American marten is considered to be cold-moist and cold-dry forests with multi-stories, large tree structure and closed canopies. The threshold of $\geq 40\%$ of the historical amount of source habitat in a watershed was used to identify watersheds with a relatively high amount of source habitat. Watersheds that contain $\geq 40\%$ of the estimated historical median amount of source habitat are believed to provide for habitat distribution and connectivity, and better contribute to species viability across the forest. Not all watersheds on the Wallowa-Whitman NF have the potential to provide source habitat for marten; historically 76% of the watersheds provided source habitat and currently 68% of the watersheds provide source habitat. Although the viability outcomes for the current condition are lower than the historical, habitat is estimated to currently exist in the quality, quantity, and distribution capable of supporting a viable marten population at the Wallowa-Whitman National Forest scale.

Grande Ronde River- Beaver Creek

According to a GIS query, the Beaver Creek- Grande Ronde watershed provides 2,399 acres of marten source habitat that can contribute to a stable or increasing population out of 33,101 (7%) potential acres of marten habitat. The current watershed index is 0.63 with the historic watershed index at 2.64, indicating a high historic level of habitat quality and a current lower level of habitat quality and quantity. This watershed currently does not provide $\geq 40\%$ of the median amount of source habitat that occurred historically, and is not above the threshold necessary to support marten population viability (Penninger and Keown 2011a). The majority of habitat is found in the southern section of the watershed and is not connected to the habitat found within the project area. The size and distribution of the patches of marten habitat within the project area indicate that this area is unlikely to support a source population of marten, now or in the future. The patches of source and potential habitat are small relative to the home range size of marten and separated by large patches of non-habitat that do not have the capability to provide marten habitat, due to the abundance of warm dry forest types and naturally occurring forest opening. The combination of warm, dry forest types, early seral stages, and high levels of disturbance make this area unlikely to support a stable or increasing population of marten. No marten have been detected within the project area boundary. Marten are not suspected to occur through the project area and as such, effects on marten populations from the Bird Track Springs project alternatives will not be analyzed in this document.

III. Northern Goshawk

Viability Determination

Throughout the Interior Columbia Basin, the amount of source habitat (i.e., habitat requirements to provide long term population persistence) available to the goshawk has declined from historical conditions. The

greatest declines have occurred in the interior ponderosa pine and western larch forest types. It is estimated that there has been a 96% decline in old forest single-story ponderosa pine (Wisdom et al. 2000). However the interior Douglas-fir, grand fir, white fir, lodgepole pine, and juniper sagebrush have all increased in abundance from historical conditions. The overall decline in source habitat and strong decline in the ponderosa pine cover type is offset somewhat by increases in these other cover types and structural stages that provide source habitat.

Additional source habitat analysis was conducted at a finer scale on National Forest lands as part of a species viability assessment conducted in support of the Blue Mountains Forest Plan revision (Penninger and Keown 2011b). The threshold of $\geq 40\%$ of the historical amount of source habitat in a watershed was used to identify watersheds with a relatively high amount of source habitat. Watersheds that contain $\geq 40\%$ of the estimated historical median amount of source habitat are believed to provide for habitat distribution and connectivity, and better contribute to species viability across the forest. Thirty-two of the thirty-five watersheds on the Wallowa-Whitman National Forest (WWNF) which historically provided source habitat are above the historical median of source habitat providing 440,696 acres (94% of historical condition) of goshawk habitat. While the presence of roads and trails has decreased the habitat effectiveness of source habitat in most watersheds (67% in the low habitat effectiveness class) the majority of watersheds (86%) on the WWNF have high watershed index scores. High watershed index scores indicate good habitat abundance with low departure from historical conditions, and high habitat quality, with greater 50% of the source habitat being late-successional habitat.

The current viability outcome index for the WWNF show that current source habitat for the goshawk is slightly lower than for the entire Blue Mountains but is very near historical conditions, indicating that suitable habitats are broadly distributed and of high abundance, and the goshawk is likely well-distributed throughout the WWNF (Penninger and Keown 2011b).

LRMP Standards and guidelines- The Regional Forester's Eastside Forest Plan Amendment #2 (SCREENS) requires that all known and historically used goshawk nest-sites be protected from disturbance. An active nest is defined as a nest that has been used by goshawks within the past five years. SCREENS requires that a 30-acre buffer of the most suitable nesting habitat be established around every known active and historical nest tree(s), that it be deferred from harvest, and that a 400-acre post fledging area be established around every known active nest site. While harvest activities can occur within the PFA, up to 60% of the area should be retained in LOS conditions and harvest is to promote the development of LOS. Management of the PFA is intended to provide a diversity of forest conditions. Thinning from below with irregular spacing of leave trees would maintain the appropriate stand composition and structure. A seasonal restriction on logging in the PFA would be implemented during the nesting season from March 1 – September 30.

Grande Ronde River- Beaver Creek

The Bird Track Springs Langley project lies within the Beaver Creek- Grande Ronde River watershed (5th HUC). This watershed contains 7,956 acres of source habitat (habitat that can support a stable or increasing population of goshawks). The current watershed index is 2.55 and the historic watershed index is 2.94 indicating a high level of habitat quality and quantity both now and historically. This watershed currently provides $\geq 40\%$ of the median amount of source habitat that occurred historically, which is above the threshold necessary to support goshawk population viability (Penninger and Keown 2011). Multiple historic goshawk nests have been identified within the watershed, however none have been active within the past 5 years. Die off of trees in those areas due to insects is suspected to have made the historic nest sites unsuitable.

Project Area

There are no known historic goshawk nests within Forest Service land affected by project activities. The project area contains no source habitat for goshawks on Forest Service land. Potential habitat exists on the Jordan Creek Ranch but a history of heavy harvest has resulted in most of the land being unsuitable for goshawk nesting.

Direct/Indirect Effects

Alternative 1- The no action alternative would have no effect on northern goshawks because there would be no harvest or associated disturbance.

Alternative 2- Under the proposed action, harvest is planned on 1,059 acres of private land to obtain racking material and large wood structure. Approximately 197 acres of small diameter trees will be cleared to enlarge a meadow for cattle grazing, 562 acres will be treated with an improvement harvest and approximately 300 acres would be treated with an overstory removal harvest. The 300 acres of overstory removal is considered a priority and would be treated before the improvement harvest units. The overstory removal would take place in stands containing mostly larch infected with mistletoe in the overstory and thick, small diameter grand fir and douglas fir in the understory. There would be no direct effect to nesting goshawks as the majority of habitat proposed for treatment is not suitable nesting habitat. Goshawks that may nest in the vicinity of the private land could potentially use the area for hunting. The proposed improvement harvest would retain overstory canopy, snags and down wood and units with this treatment would remain suitable for hunting. The overstory removal harvest would create habitat unsuitable for goshawk hunting in the short to medium term (0-25 years).

Because this project does not affect source habitat post-treatment availability of source habitats would continue to exceed the threshold of 40% of the historical amount in the Grande Ronde River/Beaver Creek and Five Points- Grande Ronde watersheds, thereby continuing to contribute to habitat distribution and species viability on the WWNF.

Cumulative Effects- There are no known goshawk nests within the units proposed for treatment on private land and proposed treatments will not affect goshawk source habitat. For these reasons there will be no cumulative effects.

IV. Pileated Woodpecker

Viability determination

Habitat trends of the pileated woodpecker were assessed at the Interior Columbia Basin, Blue Mountains ecological reporting unit (ERU), and WWNF scales using information provided by Wisdom et al. (2000) and the species viability assessment conducted by Wales (2011) in support of the Blue Mountains Forest Plan revision.

A fine-scale analysis of source habitat on National Forest lands in the Blue Mountains, including the WWNF was conducted in 2011 (Penninger and Keown 2011c). This analysis indicated that there has been a decline in the amount of source habitat on the WWNF from historical conditions. However, source habitat of the pileated woodpecker is still available in adequate amounts and distribution to maintain pileated species viability on the WWNF. Currently, there are approximately 206,374 acres (57% of historical condition) of source habitat on the WWNF, with twenty-nine of the thirty-five watersheds

(83%) on the WWNF that historically provided source habitat, continuing to provide that habitat. Reductions of snags and the presence of roads has decreased the quality of source habitat in many watersheds but 33% of the watersheds on the WWNF have high watershed index scores, indicating good habitat abundance, moderate to high snag densities and low to moderate road densities. Additionally, 29% of the watersheds are in the moderate category. Watersheds having $\geq 40\%$ of the median amount of source habitat are distributed across the WWNF and found in all clusters.

The viability assessment indicates the WWNF still provides for the viability of the pileated woodpecker. The pileated woodpecker is distributed across the WWNF and there are adequate amounts, quality, and distribution of habitat to provide for pileated woodpecker population viability.

Grande Ronde River- Beaver Creek

This watershed contains 3,266 existing acres of pileated source habitat (habitat that can support a stable or increasing population of pileated) out of 48,697 (7%) potential acres of marten habitat. The current watershed index is 2.48 with the historic watershed index at 2.94, indicating a high historic level of habitat quality and a current high level of habitat quality and quantity. This watershed currently provides $\geq 40\%$ of the median amount of source habitat that occurred historically, and is above the threshold necessary to support pileated population viability (Penninger and Keowen 2011c). Habitat is scattered across the watershed, including in the area of the proposed action.

Project Area

The project area contains no source habitat for pileated woodpeckers on Forest Service land. Potential habitat exists on the Jordan Creek Ranch, however a history of heavy harvest that targeted snags and down wood left little suitable habitat for pileated woodpeckers.

Direct/Indirect Effects

Alternative 1- The no action alternative would have no effect on pileated woodpeckers because there would be no harvest or associated disturbance.

Alternative 2- Under the proposed action, no harvest will take place on Forest Service land. Harvest is planned on 1,059 acres of private land to obtain racking material and large wood structure. Approximately 197 acres of small diameter trees will be cleared to enlarge a meadow for cattle grazing, 562 acres will be treated with an improvement harvest and approximately 300 acres would be treated with an overstory removal harvest. The 300 acres of overstory removal is considered a priority and would be treated before the improvement harvest units. The overstory removal would take place in stands containing mostly larch infected with mistletoe in the overstory and thick, small diameter grand fir and douglas fir in the understory. Harvest activities will reduce canopy cover which can increase predation rates for pileated woodpeckers and degrade potential habitat. Targeting mistletoe and other disease affected trees will reduce snag recruitment through mortality. Thinning to allow the remaining trees more space to grow will reduce competition mortality, further reducing future snags. Private land is not required to maintain certain levels of snag habitat, however the land manager has stated that all existing snags will be maintained. Pileated woodpeckers might use the land for foraging but due to the lack of large snag structure, they are not expected to use the land for nesting. Because this project does not affect source habitat Post-treatment availability of source habitats would continue to exceed the threshold of 40% of the historical amount in the Grande Ronde-Beaver Creek and Grande Ronde-Five Points watersheds thereby continuing to contribute to habitat distribution and species viability on the WWNF.

Cumulative Effects- Past, present and reasonably foreseeable future actions were analyzed for cumulative impacts to the species. Effects of past activities including road construction, fire suppression, prescribed

fire, woodcutting and timber management on WWNF lands have been incorporated into the existing conditions for amounts and locations of pileated woodpecker habitat in the analysis area. Past harvest on the Jordan Creek Ranch has resulted in an existing condition of a snag deficient landscape. While this project will not increase the levels of snags it will not contribute to cumulative effects.

Snag and Log Habitat: Primary Cavity Excavators (PCEs)

Background information

More than 80 species of wildlife use snags and living trees with defects (deformed limbs or bole, decay, hollow, or trees with brooms) in the interior Columbia River basin (Bull et al. 1997). The Blue Mountains of Oregon have 39 bird and 23 mammal species that use snags for nesting or shelter (Thomas 1979).

PCEs rely heavily on decadent trees, snags, and down woody material and can be used as an indicator species of snag habitat. These birds depend on snags for nesting and roosting, and snags and down wood for foraging. A key assumption is if habitat is provided for PCEs, then habitat requirements for secondary cavity users will be met. Suitable nest sites are often considered the limiting factor for cavity nesting bird populations.

Many PCEs, and secondary cavity nesters, feed on forest insects and play a vital role in maintaining healthy, productive forests. Large snags and trees provide more functions, for more species, for a greater period of time than smaller ones. Large woody structures are not easily or quickly replaced. Down woody material is an important component of the forest ecosystem because of its role in nutrient cycling and immobilization, soil productivity, and water retention (Johnson and O'Neil 2001). It also provides habitat for mycorrhizal fungi, invertebrates, reptiles, amphibians, and small mammals. For these reasons emphasis should be placed on conserving or creating these structures when carrying out forest management practices. There is increasing pressure on snag and log habitat as logging safety restrictions and firewood gathering intensify.

LRMP standards

LRMP direction is to maintain snags and green tree replacement trees of ≥ 21 inches dbh, or whatever is the representative diameter of the overstory layer if it is < 21 inches dbh, at 100% potential population levels of primary cavity excavators (U.S. Forest Service 1995). The LRMP used information from Wildlife Habitats in Managed Forests (Thomas et al. 1979; at least 2.25 snags > 20 in dbh per acre) to establish minimum snag guidelines. More recently, several studies have shown these snag densities are too low to meet the needs of many primary and secondary cavity users (Bull et al. 1997, Harrod et al. 1998, Korol et al. 2002). Consequently, the original standards for snags and down wood from Thomas et al. (1979) were replaced with the Regional Forester's Forest Plan Amendment #2 (U.S. Forest Service 1995). Bull et al. (1997) found the 2.25 snags/acre insufficient and that 4 snags/acre (2.8 are between 10-20 inches dbh and 1.2 are > 20 inches dbh) is more appropriate as a minimum density required by primary and secondary cavity users for roosting, nesting, and foraging needs. Harrod et al. (1998) determined a range of historic snag densities for dry eastside forests between 5.9-14.1 snags/acre (5-12 are between 10-20 inches dbh and 0.9 to 2.1 are > 20 inches dbh). Korol et al. (2002) determined that HRV for large snags (20 inches dbh) for dry eastside mixed conifer forest with a low intensity fire regime was 2.9 to 5.4 snags/acre.

Direction from the Eastside Screens requires that pre-activity levels of logs be left unless those levels exceed those shown in Table 12. Live green trees of adequate size must also be retained to provide replacements for snags and logs through time. Generally green tree replacements (GTRs) need to be retained at a rate of 25 to 45 trees per acre, depending on biophysical group. Pre-activity levels of logs should also be left unless levels exceed amounts specified in Eastside Screens (U.S. Forest Service 1995; Table 3). Larger blowdowns with intact tops and root wads are preferred to shorter sections of tree boles.

Table 4 - LRMP standards for down wood¹ (U.S. Forest Service 1995).

Stand type	Pieces/acre ¹	Piece length	Diameter small end	Linear ft/acre
Ponderosa Pine	3-6	> 6'	12"	40'
Mixed conifer	15-20	> 6'	12"	140'
Lodgepole Pine	15-20	> 8'	8"	260'

¹ The table converts to about 0.4, 1.7, and 3.3 tons/acre for ponderosa pine, mixed conifer, and lodgepole pine,

The Decayed Wood Advisor (DecAID)

Integration of the latest science is incorporated into this analysis using DecAID Advisor (version 2.2) (Mellen-McLean et al. 2012) which is an internet-based summary, synthesis, and integration (a "meta-analysis") of the best available science: published scientific literature, research data, wildlife databases, forest inventory databases, and expert judgment and experience. In addition to data showing wildlife use of dead wood, DecAID also contains data showing amounts and sizes of dead wood across the landscape based on vegetation inventory data.

Data from unharvested plots are assessed separately and these data can be used as a reference condition to approximate HRV of dead wood. There is debate among professionals on the impact fire exclusion has on stands relative to HRV of dead wood. One caveat to using these data is, "On the eastside in particular, current levels of dead wood may be elevated above historical conditions due to fire suppression and increased mortality, and may be depleted below historical levels in local areas burned by intense fire or subjected to repeated salvage and firewood cutting" (Mellen-McLean et al. 2012). Even with this caveat, the data are used in this analysis because: they are still some of the best data available to assess HRV of dead wood, even in eastside dry forests; they are the only available data showing distribution and variation in snag and down wood amounts across the landscape; the data from unharvested stands are in the range of other published data on HRV of dead wood even in the drier vegetation types. For a full discussion see [HRV Dead Wood Comparison](#) (Mellen-McLean 2011).

Existing Conditions

The existing condition analysis was done at the scale of the affected watershed (Grande Ronde River-Beaver Creek) as this is the most appropriate scale for a DecAID analysis.

The habitat categories from DecAID that most closely reflect conditions within the project area are the "Small/medium tree" structural conditions in "Ponderosa Pine/Douglas-fir Forest" wildlife habitat descriptions. DecAID synthesized data for wildlife use of snag densities, by a representative sample of PCEs possibly found within the analysis area, are given below (Table 5). Effects are discussed in terms of snag densities with and without the proposed treatments, and how those densities relate to tolerance levels for wildlife species that utilize snags. The information is presented at three statistical tolerance levels which may be interpreted as three levels of "assurance": low (30% TL), moderate (50% TL) and high

(80% TL). Each tolerance level is the amount of assurance a land manager would have that they are meeting the habitat needs of the specific species (e.g., 0.3 snags per acre <10 inches dbh would provide a 30% assurance of meeting habitat needs for white headed woodpeckers).

Table 5. DecAID synthesized data for wildlife use of snag densities for ponderosa pine/Douglas-fir habitat type and small/medium trees and larger trees structural condition classes (PPDF_S/L).

Species	Snags > 10 in dbh			Snags > 20 in dbh		
	30% TL ¹	50% TL	80% TL	30% TL	50% TL	80% TL
	Snag density (#/acre)	Snag density (#/acre)	Snag density (#/acre)	Snag density (#/acre)	Snag density (#/acre)	Snag density (#/acre)
White-headed woodpecker	0.3	1.7	3.7	0.5	1.8	3.8
Pygmy nuthatch	1.1	5.6	12.1	0.0	1.6	4.0
Black-backed woodpecker	2.5	13.6	29.2	0.0	1.4	5.7
Williamson's sapsucker	14.0	28.4	49.7	3.3	8.6	16.6
Pileated woodpecker	14.9	30.1	49.3	3.5	7.8	18.4

¹ TL = Tolerance level.

Existing snag densities (< 20in dbh, Table 7) were compared to wildlife tolerance levels (Table 5). For white-headed woodpeckers, snag density estimates are between the 50% and 80% TL for snags >10 in dbh and snags > 20 in dbh in dry and upland forest and at 80% TL for all snags >10 dbh in the cold upland forest. For pygmy nuthatches, snag densities are between the 30% and 50% TL for snags >10 in dbh and snags > 20 in dbh in all in dry and upland forest and at 80% TL for snags >10 dbh in the cold upland forest. For black-backed woodpeckers, snag densities are below 30% and 50% TLs for snags >10 in dbh and between 30%-50% TLs for snags > 20 in dbh in dry and upland forest and at 30% TL for snags >10 dbh in the cold upland forest. For Williamson's sapsucker and the pileated woodpecker, snag densities are well below the 30% TL for snags >10 in dbh and around 30% TL for snags > 20 in dbh for all potential vegetation groups. The studies used in DecAID to derive this data are largely from NE Oregon and are applicable to the project area. At the existing snag densities and sizes, Williamson's sapsuckers and pileated woodpeckers will not use the majority of the project area for nesting, roosting, or foraging. These birds need areas with snag densities much higher than those in the project area. Historically, white-headed woodpeckers probably used most of the lower elevation areas within the analysis area. Source habitats for low-elevation old-forest species have declined more than any other habitat type from historical to current conditions and populations of white-headed woodpeckers have declined strongly along with this loss of habitat (Wisdom et al. 2000).

Down wood in all size classes (0 - 0.25 in, 0.25 - 1 in, and > 3 in) is common throughout the Grande Ronde River-Beaver Creek Watershed, therefore the total volume of down wood exceeds LRMP standards. Within the watersheds the cold upland forest types contain (< 30 tons/acre fuel loads), the dry upland forest types contain (< 20 tons/acre fuel loads), and the moist upland forest types contain (>30 tons/acre fuel loads).

Direct/Indirect Effects

Alternative 1- The no action alternative would have no effect on primary cavity excavators because there would be no harvest or associated disturbance.

Alternative 2- Under the proposed action approximately 197 acres of small diameter trees will be cleared to enlarge a meadow for cattle grazing, 562 acres will be treated with an improvement harvest and approximately 300 acres would be treated with an overstory removal harvest. The 300 acres of overstory removal is considered a priority and would be treated before the improvement harvest units. The overstory removal would take place in stands containing mostly larch infected with mistletoe in the overstory and thick, small diameter grand fir and Douglas-fir in the understory. Both the improvement harvest and overstory removal would reduce recruitment of snags on the landscape. The improvement harvest would retain the healthiest trees reducing mortality from disease and limiting competition mortality. Overstory removal harvest would remove mistletoe infected larch and reduce canopy cover over grand fir and Douglas-fir to allow them to grow faster and healthier. However the land manager has stated that existing snag habitat and down wood would be retained on the landscape to the best of their ability. Snags on forest service land would not be affected and snag levels within the watershed will continue to meet the minimum thresholds for primary cavity excavators and forest plan standards for ecologically appropriate numbers.

Cumulative Effects- Effects of past activities including road construction, fire suppression, prescribed fire, and timber management on WWNF have been incorporated into the existing condition. Firewood cutting on Forest Service land will continue to reduce available snags and logs, but the effect is limited to areas adjacent to open roads. Roads that are temporarily open for harvest activities on private land will not temporarily increase firewood cutting activities.

Neotropical Migratory Bird Species

Background Information-

A migratory bird is defined by the Migratory Bird Treaty Act of 1918 as any species or family of birds that live, reproduce or migrate within or across international borders at some point during their annual life cycle. They are a large group of species with diverse habitat needs spanning nearly all successional stages of most plant community types. Nationwide declines in population trends for migratory species, especially neotropical species, have developed into an international concern. Recent analyses of local and regional bird population counts, radar migration data, and capture data from banding stations show that forest-dwelling bird species, have experienced population declines in many areas of North America (Finch 1991). Habitat loss is considered the primary reason for declines. Other contributing factors include fragmentation of breeding grounds, deforestation of wintering habitat, and pesticide poisoning.

The U.S. Fish and Wildlife Service (FWS) is the lead federal agency for managing and conserving migratory birds in the United States; however under Executive Order (EO) 13186 all other federal agencies are charged with the conservation and protection of migratory birds. In response to this, the Forest Service has implemented management guidelines that require the Forest Service to address the conservation of migratory bird habitat and populations when developing, amending, or revising management plans (Executive Order 13186, 2001). To aid in this effort, the USFWS published *Birds of Conservation Concern 2008 (BCC 2008)*. The overall goal of the report is to accurately identify the migratory (and non-migratory) bird species that represent the high conservation priorities. BCC 2008 uses current conservation assessment scores from three bird conservation plans: Partners in Flight North American Landbird Conservation Plan (PIF; Rich et al. 2004), the United States Shorebird Conservation Plan (USSCP; Brown et al. 2001, USSCP 2004), and the North American Waterbird Conservation Plan (NAWCP, Kushlan et al. 2002).

Bird Conservation Regions (BCRs) are used to separate ecologically distinct regions in North American with similar bird communities, habitats, and resource management issues. Species contained within the

BCC are identified for each BCR. The La Grande District and majority of the Wallowa-Whitman National Forest (WWNF) is found within BCR-10, Northern Rockies.

Existing Conditions

BCR-10 includes the Northern Rocky Mountains and outlying ranges in both the United States and Canada, and also the inter-montane Wyoming Basin and Fraser Basin. The Rockies are dominated by a variety of coniferous forest habitats. Drier areas are dominated by ponderosa pine, with Douglas-fir and lodgepole pine at higher elevations and Engelmann spruce and subalpine fir even higher. More mesic forests to the north and west are dominated by eastern larch, grand fir, western red cedar and western hemlock. Five migratory species of conservation concern have been identified as potentially occurring within the project area (Table 18). No formal surveys have been conducted specifically for any of these species within the project area, although terrestrial birds were monitored in the Blue Mountains from 1994-2011 as part of the U.S. Forest Service Avian Monitoring Program (Huff and Brown 2006), as well as multiple annual breeding bird survey route through the La Grande and Baker districts (Sauer et al. 2011).

Table 6 - Migratory species of conservation concern identified within the Bird Track Springs-Langley analysis area

Focal Species	Key Habitat Relationships		
	Vegetative	Vegetation Structure	Special Considerations
	Dry Forest		
White-headed woodpecker	Ponderosa pine	Large patches of old forest with large trees and snags	
Flammulated owl	Ponderosa pine, Douglas-fir	Old forest with grassy opening and dense thickets	Thicket patches for roosting; grassy openings for foraging
Williamson's Sapsucker	Ponderosa pine, Douglas-fir, grand fir	Mature open and mixed coniferous-deciduous forests	Snags are a critical component
Lewis' woodpecker	Ponderosa pine	Patches of burned old forest	Soft snags for excavation; pesticide spraying may reduce prey base
Bald Eagle	Riparian Habitat		
	Forested areas near water	Large bodies of waters, along rivers, lakes and reservoirs	Timing restrictions and buffers associated with nesting activity

Dry Forests

Dry forests in relation to migratory bird species are described as coniferous forests composed exclusively of ponderosa pine or dry stands codominated by ponderosa and Douglas fir or grand fir (Altman 2000). Large-scale declines in open stands, especially those with large trees, have raised concern for such species as the white-headed woodpecker, flammulated owl, Williamson's sapsucker, and Lewis' woodpecker. The majority of the project area is made up of dry forest.

Riparian Habitat

There is a known bald eagle nest site that occurs on private land within the project area. A bald eagle pair has nested consistently in this site for multiple years and are expected to continue barring disturbance.

Direct/Indirect Effects

Alternative 1- The no action alternative would have no effect on primary cavity excavators because there would be no harvest or associated disturbance.

Alternative 2- Under the proposed action approximately 197 acres of small diameter trees will be cleared to enlarge a meadow for cattle grazing, 562 acres will be treated with an improvement harvest and approximately 300 acres would be treated with an overstory removal harvest. The 300 acres of overstory removal is considered a priority and would be treated before the improvement harvest units. The overstory removal would take place in stands containing mostly larch infected with mistletoe in the overstory and thick, small diameter grand fir and Douglas-fir in the understory. The improvement harvest and overstory removal are intended in the medium term to produce large, healthy trees. The current owner and land manager are conscious of the ecological needs of a diverse array of species and plan on maintaining snag habitat, down wood and forested stands. However, with regular harvest occurring, and a lack of prescribed fire, it is unlikely these stands will achieve an old forest structure stage. The units with an improvement harvest will likely result in larger trees due to decreased competition and these area could provide better habitat for neotropical migrants like the chipping sparrow.

The riparian area along the Grande Ronde river currently provides habitat for neotropical migrants. Stream channel reconstruction will remove some habitat that currently exists through and will result in disturbance in the short term. Connecting the channelized streams with the associated floodplain and adding cottonwood and willow cuttings along the new stream banks and will result in better quality habitat for species such as the yellow-billed cuckoo and the Lewis' woodpecker.

Direct effects to bald eagles could include nest abandonment or nest failure due to disturbance from construction activities. Disruptive activities in or near eagle foraging areas can interfere with feeding young, reducing chances of survival and productivity. Bald eagle restrictions will be implemented for the project to avoid disturbance of the eagles. These restrictions include: 1) A no activity buffer of 600ft and, 2) Timing restrictions from Feb 15th- August 15th.

Cumulative Effects- Effects of past activities including road construction, fire suppression, prescribed fire, and timber management on WWNF lands have been incorporated into the existing condition. Livestock grazing is expected to continue within the private land. Habitat improvements afforded by the proposed action for chipping sparrow may also increase access of areas to livestock and brown-headed cowbirds. The potential for increase in nest parasitism is expected to be most pronounced in areas adjacent to existing cattle operations and agriculture on private lands.

Beaver Ponds

The benefits of beaver dams to river systems and associated riparian areas are well known. The ponds, wetlands, and meadows formed by dams are effective at flood control, create habitat biodiversity within the streams and within riparian areas and provide water cleansing. Beavers are a semi-common occurrence along the Grande Ronde, though their occupancy is generally short-lived. Past management activities have severely degraded riparian areas and reduced food availability for beavers. The lack of

river connection with the floodplain often occurs in beaver dam breach and fail within a season. Oregon Department of Fish and Game indicate that mountain lion numbers are high in this area and predation is a factor in low beaver numbers. Beavers are also hunted in parts along the Grande Ronde.

Alternative 1- The no action alternative would have no effects on beaver ponds because no action would be taken.

Alternative 2- In the proposed action, 2 Beaver Dam Analogs (BDA) will be created as part of the restoration process. BDA's are channel spanning structures that mimic or reinforce natural beaver dams. Like natural beaver dams they are semi-porous to water, sediment, fish and other water-borne materials. They are intended to be temporary features on the landscape and encourage colonization by beaver and the connection of floodplain surfaces and an overall increase in instream and riparian habitat heterogeneity and quality (Castro et al. 2015). A third beaver site consists of a historical pond and associated structure that will be enhanced through more connectivity to the river network. Additionally, willow and cottonwood plantings will increase food availability and associated habitat. This area is currently not inhabited by beaver, though the historical pond indicates previous occupancy. Any effects from this project to beaver will be positive. Hunting is allowed within the project area. As part of this project, the Forest Service will install signs asking hunters to not trap within the restoration area. If it becomes apparent that beavers are being removed from the area through trapping, ODFW will consider re-zoning the area as non-hunting (ODFW, personal communication).

Literature Cited

- Brown, S., and C. Hickey. "B., Harrington, and R. Gill (eds). 2001. The US Shorebird Conservation Plan." *Manomet Center for Conservation Sciences, Manomet, MA.*
- Bull, E.L. 1987. Ecology of the pileated woodpecker in northeastern Oregon. *Journal of Wildlife Management* 51:472-481.
- Bull, E.L., D.G. Parks, and T.R. Torgerson. 1997. Trees and logs important to wildlife in the interior Columbia River Basin. Gen. Tech. Rep. PNW-GTR-391. USDA, Forest Service, Pacific Northwest Research Station. Portland, OR. 55 pp.
- Bull, E.L., Heater, T.W. 2001. Home range and dispersal of the American marten in northeastern Oregon. *Northwestern Naturalist* 82:7-11.
- Bull, E.L., Hohmann, J.H., 1994. Breeding biology of northern goshawks in northeastern Oregon. *Studies in Avian Biology* 16:103-105.
- Buskirk, S.W., Ruggiero, L.F., Aubry, K.B., Lyon, J., Zielinski, W.J. 1994. The scientific basis for conserving forest carnivores. Gen. Tech. Rep. RM-254. Ft Collins, CO, USDA Forest Service, Rocky Mountain Forest and Range Experiment Station.
- Castro, J., Pollack, M., Jordan, C., Lewallen, G., Woodruff, K. 2105. The beaver restoration guidebook: working with beaver to restore streams, wetlands, and floodplains. Version 1.0. United States Fish and Wildlife Service, Portland, Oregon. 189 pp. Online at: <http://www.fws.gov/oregonfwo/ToolsForLandowners/RiverScience/Beaver.asp>.
- Creel, S., J.E. Fox, A. Hardy, J. Sands, B. Garrott, and R. Peterson. 2002. Snowmobile activity and Glucocorticoids stress responses in wolves and elk. *Conservation Biology* 16:809-814.
- Csuti, B., A.J. Kimerling, T.A. O'Neil, M.M. Shaughnessy, E.P. Gaines, J.C. Hak. 2001. Atlas of Oregon wildlife: distribution, habitat and natural history. Oregon State University Press, Corvallis, OR. 492pp.
- Edge, W.D. 1982. Distribution, habitat use and movement of elk in relation to roads and human disturbances in western Montana. M.S. Thesis. University of Montana, Missoula, MT. 98 pp.
- Harrod, R.J., W.L. Gaines, W.E. Hartl, and A. Camp. 1998. Estimating historical snag density in dry forests east of the Cascade Range. Gen. Tech. Rep. PNW-GTR-428. USDA Forest Service, Pacific Northwest Research Station. Portland, OR. 16pp.
- Huff, M., and M. Brown. 2006. Eight years of terrestrial bird monitoring on National Forest of the Pacific Northwest. Cooperative agreement between U.S. Fish and Wildlife Service and U.S. Forest Service's Avian monitoring program. Portland, OR. 130 pp.
- Johnson, D.H., and T.A. O'Neil, Managing Directors. 2001. Wildlife-habitat relationships in Oregon and Washington. Oregon State University Press, Corvallis, OR. 736 pp.

- Korol, J.J., M.A. Hemstrom, W.J. Hann, and R. Gravenmier. 2002. Snags and down wood in the Interior Basin Ecosystem Management Project. *In* Proceedings of the symposium on the Ecology and Management of Dead Wood. Gen. Tech. Rep. PSW-GTR-181. USDA Forest Service, Pacific Southwest Research Station. 28pp.
- Kushlan, James Anthony, Melanie J. Steinkamp, K. C. Parsons, J. Capp, M. Acosta Cruz, M. Coulter, I. J. Davidson et al. "Waterbird conservation for the Americas: the North American waterbird conservation plan, version 1." (2002).
- Landres, P.B., P. Morgan, F.J. Swanson. 1999. Overview of the use of natural variability concepts in managing ecological systems. *Ecological Applications* 9: 1179-1188.
- Marshall, D.B. 1992. Status of the Northern Goshawk in Oregon and Washington. Audobon Society of Portland, Portland, OR. 35 pp.
- Mellen-McLean, Kim, Bruce G. Marcot, Janet L. Ohmann, Karen Waddell, Susan A. Livingston, Elizabeth A. Willhite, Bruce B. Hostetler, Catherine Ogden, and Tina Dreisbach. 2012. DecAID, the decayed wood advisor for managing snags, partially dead trees, and down wood for biodiversity in forests of Washington and Oregon. Version 2.20. USDA Forest Service, Pacific Northwest Region and Pacific Northwest Research Station; USDI Fish and Wildlife Service, Oregon State Office; Portland, Oregon. <http://www.fs.fed.us/r6/nr/wildlife/decaid/index.shtml>
- Morrison, M.L., B.G. Marcot, R.W. Mannan. 2006. Wildlife-habitat relationships: concepts and applications. Island Press, Washington, D.C.
- Powell, David C. 2010. Range of variation recommendations for dry, moist, and cold forests. Rep # F14-SO-WP-Silv-03. USDA Forest Service. Pendleton, OR.
- Peninger, M., K. Keown(a). 2011 Amerian Marten Management Indicator Species Assessment. USDA Forest Service. Wallowa-Whitman National Forest - DRAFT.
- Peninger, M., K. Keown(b). 2011 Northern Goshawk Management Indicator Species Assessment. USDA Forest Service. Wallowa-Whitman National Forest - DRAFT.
- Penninger, M., K. Keown(c). 2011. Pileated Woodpecker Management Indicator Species Assessment. USDA Forest Service. Wallowa-Whitman National Forest - DRAFT.
- Regional Interagency Executive Committee. 1995. Ecosystem Analysis at the Watershed Scale- Federal Guide for Watershed Analysis Version 2.2. Regional Ecosystem Office. Portland, OR.
- Rich, T.D., C.J. Beardmore, H. Berlanga, P.J. Blancher, and M.S.W. Bradstreet. 2004. Partners in Flight North American landbird conservation plan. Cornell Laboratory of Ornithology. Ithaca, NY. 84 pp.
- Rowland, M.M., M.J. Wisdom, B.K. Johnson, and M.A. Penninger. 2005. Effects of roads on elk: Implications for management in forested ecosystems. Pages 42-52 *in* Wisdom, M.J., technical editor. 2005a. The Starkey Project: a synthesis of long-term studies of elk and mule deer. Alliance Communications Group. Lawrence, KS.

- Sauer, John R., and William A. Link. "Analysis of the North American breeding bird survey using hierarchical models." *The Auk* 128.1 (2011): 87-98.
- Squires, J.R. 2000. Food habits of Northern goshawks nesting in south central Wyoming. *The Wilson Bulletin* 536-539.
- Thomas, J.W. 1979. Wildlife habitats in managed forests: The Blue Mountains of Oregon and Washington. Agriculture Handbook No. 553. USDA Forest Service. Washington D.C. 512 pp.
- Thomas, J.W., D.A. Leckenby, M. Henjum, R.J. Pedersen, and L.D. Bryant. 1988. Habitat effectiveness index for elk on blue mountain winter ranges. U.S. Department of Agriculture, Forest Service, PNW-GTR-128, Portland, OR. 28 pp.
- Toweill, D.E., and J.W. Thomas. 2002. North American Elk: Ecology and Management. The Wildlife Management Institute. Washington D.C. 962 pp.
- U.S.Forest Service. Land and Resource Management Plan Wallowa-Whitman National Forest. USDA, Forest Service. 1990. Pacific Northwest Region (R6), Wallowa-Whitman National Forest.
- U.S.Forest Service. Regional Forester's Forest Plan Amendment #2. PACFISH/INFISH/SCREENS Information Guide. 1995. Pacific Northwest Region (6), Wallowa-Whitman National Forest, USDA Forest Service.
- Wisdom, M.J., technical editor. 2005. The Starkey Project: a synthesis of long-term studies of elk and mule deer. Alliance Communications Group. Lawrence, KS.
- Wisdom, M.J., Holthausen, R.S., Wales, B.C., Hargis, C.D., Saab, V.A., Lee, D.C., Hann, W.J., Rich, T.D., Rowland, M.M., Murphy, W.J., Eames, M.R. 2000. Source habitat for terrestrial vertebrates of focus in the interior Columbia Basin: Broad-scale trends and management implications. Quigley, Thomas M. PNW-GTR-485. Portland, OR, USDA Forest Service Pacific Northwest Research Station.
- Witmer, G.W., Martin, S.K., Sayler, R.D. 1998. Forest carnivore conservation and management in the interior Columbia Basin : Issues and environmental correlates. Gen. Tech. Rep. GTR-PNW-420, 51 p. Portland, OR, USDA Forest Service, Pacific Northwest Research Station.